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ABSTRACT

This report presents existing workforce levels, training programs and career potentials and develops staffing level projections (1976-1982) based on available information for the State of Rhode Island. The study concerns itself with the environmental pollution control areas of air, noise, potable water, pesticides, radiation, solid waste, wastewater, and energy. The format includes workforce profiles, projections, growth and career options for each of the areas investigated. Additional sections of the report outline state legislation and selected post secondary institutions with formal Environmental/Energy programs. A state profile and summary is included for cross-reference. The selected bibliography is appended in the Region I report. This document is one in a series of 69 which presents information for each of the states, Washington, D.C., Puerto Rico, and the Virgin Islands, and national and regional summaries. (CS)

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A National Environmental/Energy Workforce Assessment

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NATIONAL ENVIRONMENTAL/ENERGY

WORKFORCE ASSESSMENT

for

RHODE ISLAND

Conducted by:

NATIONAL FIELD RESEARCH CENTER, INC

Under Grant from:

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

Grant #T900591010

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PREFACE

This report presents existing workforce levels, training programs, and career potentials and develops staffing level projections (1976 - 1981) based on available information for the State of Rhode Island in the environmental pollution control areas of air, noise, pesticides, potable water, radiation, solid waste, waste water, and energy. This study was carried out for the United States Environmental Protection Agency by National Field Research Center of Iowa City, Iowa.

The information and data presented in this report were compiled in large part from extensive interviews with professionals working in the respective areas and were supplemented by telephone surveys and research.

FOREWORD

The material herein contains the information and data collected for eight individual pollution control inventories conducted for Rhode Island. The format includes workforce profiles, projections, growth and career potential for each of the areas investigated. Growth projections are necessarily based on best professional estimates developed from available information and represent what are felt to be realistic figures by experts in the respective areas. The pollution control areas considered by this study are as follows:

Air

Noise

Pesticides

Potable Water

Radiation

Solid Waste

Waste Water

Energy

National Environmental Energy Workforce Assessment

Phase I

RHODE ISLAND

State Summary

I. AIR

The Division of Air Pollution Control of the Rhode Island Department of Health is responsible for achieving the national ambient air quality standards outlined in the Rhode Island State Implementation Plan. The division is principally staffed with sanitary engineers and sanitarians, who serve as field inspectors.

It is projected by department administrators that the division may increase in staff by twenty-five percent by 1982. Two sanitarians and a sanitary engineer may be recruited in the next couple of years. Currently, laboratory analytical personnel assigned to work on air pollution are under the authority of the department's Laboratory Division. The department may reorganize laboratory personnel under the direct control of the Division of Air Pollution Control in a new Technical Services Section. The division personnel may then be organized into a Compliance Section and a Technical Services Section.

The Division of Air Pollution Control may obtain responsibility for initiating a program to inspect and maintain motor vehicle emission control systems. The department may undergo a reorganization and additional personnel may be acquired. At the present time, it is considered unlikely that the Rhode Island General Assembly would support significant air pollution control staffing increases due to budget constraints.

II. NOISE

The Division of Occupational Health of the Rhode Island Department of Health has responsibility for the state's noise control activities. Rhode Island has not yet enacted statewide noise control legislation, although such proposals have been presented to the Legislature in the past. Legislation providing the State Department of Transportation with authority to regulate motor vehicle noise pollution was enacted in 1976. The Division of Occupational Health is primarily concerned with OSHA aspects of noise pollution control relating to worker safety, although the staff assist Rhode Island communities in developing municipal noise ordinances whenever requests for assistance are received.

The division has one occupational health specialist specifically designated to work with occupational health programs regarding noise pollution. This person receives technical assistance from a laborer-technician who performs monitoring/sampling duties for both noise and radiation levels.

Minimal growth in the field of noise pollution control and abatement is expected over the next five years. If additional responsibilities are acquired by 1982, the division may recruit more occupational health specialists to perform audiometric testing. Careers may be created in the public sector for industrial audiometric testing and community noise enforcement, and for regulation of highway noise levels.

III. PESTICIDES

The Rhode Island Department of Natural Resources has been designated by the U.S. Environmental Protection Agency (EPA) as the lead agency for the certification of pesticide applicators and also has responsibilities to enforce pesticide control legislation. Specific program functions are carried out by the Division of Agriculture. The Rhode Island General Assembly passed legislation during 1976 entitled the "Rhode Island Pesticide Control Act" which enables the state to comply with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as amended. The Cooperative Extension Service of the University of Rhode Island is actively involved in the training of applicators.

The Division of Agriculture has designated a plant pathologist, an entomologist, and a secretary to conduct the pesticide program. It is anticipated that the Division will hire a field inspector and an enforcement officer to spend at least fifty percent of their time on this effort to initiate an inspection and field surveillance program.

Because private applicators will be required to participate in a continued training program, there is likely to be a decrease in the number of private applicators. This will result in a corresponding increase in the number of commercial applicators providing services in the next five years. All applicators are required to participate in a retraining program within five years from the time they were first certified.

IV. POTABLE WATER

Responsibility for the state's potable water program belongs to the Division of Water Supply of the Rhode Island Department of Health. Rhode Island is currently preparing to assume primacy for the federal Safe Drinking Water Act (SDWA), but the state program lacks both an adequate staff and a certification program for water treatment plant operators. If the Division of Water Supply assumes primary enforcement responsibilities for SDWA, the Rhode Island drinking water program could double in size.

The Division of Water Supply monitors all public water supplies, approves plan specifications for water supply systems, and assures the safety of Rhode Island's drinking water. It is currently staffed with eight persons, and the water pollution control and water supply program personnel interchange functions as needs develop. The division employs mainly sanitary engineers, sanitarians, and clerks. The Health Department's Laboratory Division assists the Division of Water Supply in performing analytical services. It is staffed with chemists, microbiologists, laboratory technicians, and sanitary aides.

It is projected that one sanitary engineer and three to four sanitarians will be hired by the Division of Water Supply to perform preparatory tasks required to assume primacy for SDWA. Once the state initiates a certification program for water plant operators, demand for skilled operators is expected to increase.

V. RADIATION

Radiation control program responsibilities are carried out by the Division of Occupational Health of the Rhode Island Department of Health. Most of the division's radiation control activities concern registering and monitoring radiological health equipment such as medical and dental X-ray machines. The Rhode Island legislature in May, 1976, passed legislation authorizing emergency response planning and creating an environmental radiation surveillance network.

The division is currently staffed with radiological health specialists, occupational health specialists, chemists, and technicians. In the next five years, the division may recruit a radiological health specialist and two occupational health specialists to complement its present staff.

In the private sector, the New England Electric Company is planning the construction of two Charlestown nuclear power plant units to be completed by 1984 or 1985. The potential demand for health physicists in Rhode Island is expected to remain rather limited until these units are completed.

VI. SOLID WASTE

The Division of Solid Waste Management of the Rhode Island Department of Health has principal solid waste management responsibilities. Incinerators and sanitary landfills are the primary means by which the state's solid waste is disposed. The division is encouraging regionalization of landfills by offering state grants to communities willing to participate in the program.

A Rhode Island Solid Waste Management Corporation was created in 1974 to carry out activities required by Rhode Island's Solid Waste Management Plan. The ultimate objective of the Corporation is to maximize resource recovery, recycling, and reuse throughout Rhode Island.

The division currently is composed of five persons who include three engineers, a sanitarian, and a secretary. It is estimated that each of the state's thirty-three sanitary landfills have at least three operators employed. The Division of Solid Waste Management may recruit two chemical engineers, a sanitarian, and a secretary after 1978 to fulfill the requirements of the Federal Resource Conservation and Recovery Act. It is not anticipated that these personnel will be recruited prior to 1978 because the state has not yet enacted comprehensive legislation authorizing the State Health Department to develop a hazardous wastes management plan.

VII. WASTEWATER

Responsibility for wastewater pollution control in Rhode Island belong to the Division of Water Pollution of the State Department of Health. Rhode Island has not yet been delegated responsibility by EPA to conduct either the allocation of construction grants or the National Pollutant Discharge Elimination System (NPDES). The state advocates community regionalization in their use of common wastewater treatment plant facilities.

The division is mostly professionally staffed with sanitary engineers, a biologist, and sanitarians. Laboratory support is provided by chemists, microbiologists, laboratory technicians, and sanitary aides. By 1982, the division is projected to recruit sanitary engineers, and an aquatic biologist.

Additional wastewater treatment plant personnel will continue to be needed by Rhode Island communities to supervise, operate, and maintain treatment facilities. It has been estimated by the division that the state will need approximately 100 new wastewater treatment plant personnel in addition to those who are expected to replace existing staff through either relocation or retirement. Program officials anticipate that twenty-five operators annually enter the field and at least five operators need upgrade training each year.

VIII. ENERGY

Rhode Island's State Energy Office was created by an Executive Order of the Governor in 1975. The office is to manage the state set-aside program of petroleum supplies and to initiate programs related to energy conservation and resource development.

The Rhode Island Energy Office is currently planning a reorganization of its functions into other state agencies. It is not clear at this time just what effect a reorganization will have on the office but it is primarily involved with energy allocations.

The office has one administrator who is responsible for energy conservation and another who is attached to the Governor's Office who is involved with research and development programs. This person is attached to the Governor-appointed Energy Advisory Council.

The State Energy Office currently has a total staff of six persons, but due to reorganization and shifting of functions, it is not possible to project what the office's staffing level may be by 1982.

The New England Electric Company is planning to construct two nuclear power sites at Charlestown, Rhode Island, each of 1,200 capacity, to be completed in 1983 and 1984. United Nuclear Corporation also operates a nuclear scavenging facility whose purpose is to recover scrap from the ore used in the manufacture of fuel rods from nuclear reactors.

STATE OF RHODE ISLAND - SUMMARY

National Environmental/Energy Workforce Assessment
Pollution Control & Abatement Personnel
Projected Workforce Requirements (1976-1981)

Environmental Area	1976	1977	1978	1979	1980	1981	%/annum growth (average)
AIR[1]	15	22	24	27	29	30	16%
NOISE[2]	2	--	--	--	--	--	N/A
PESTICIDES[3]	1,112	--	--	--	--	--	N/A
POTABLE WATER[4]	19	20	23	25	27	28	8%
RADIATION[5]	10	10	11	11	12	13	5%
SOLID WASTE[6]	5	6	8	9	9	9	13%
WASTEWATER[7]	34	34	36	37	39	39	3%
ENERGY[8]	6	--	--	--	--	--	N/A
TOTALS	2,103	--	--	--	--	--	N/A

[1]The above includes only state regulatory and laboratory personnel.

[2]The above includes only state agency personnel. No other data are available.

[3]The above includes all state agency and extension service personnel as well as 400 commercial and 200 private applicators.

[4]The above includes 10 regulatory and 9 laboratory state agency personnel.

[5]The above includes 8 state agency personnel and 2 private sector individuals.

[6]The above includes only state agency personnel.

[7]The above includes only state agency personnel.

[8]The above includes only state energy agency personnel.

EDUCATION

The Rhode Island post-secondary educational institutions offer few environmental education programs. Nearly all colleges and universities within the state offer selected environmental courses in basic ecology, population, and environmental engineering techniques; however, few comprehensive environmental degree programs are available.

Two institutions in the state offer degrees with environmental career options: Roger Williams College and Woonsocket Area Vocational Technical Facility. A Bachelor of Science degree in Urban and Environmental Planning and an Associate of Science degree in Power Engineering Technology are awarded through Roger Williams College. The Associate program prepares the student for operation and maintenance of heating, ventilation, humidity control, air conditioning, and power generation equipment. While the students may also serve in such positions as engineering technician, estimator, designer, planner, inspector, and tester of engineering equipment, it is recognized that they should perform these functions with the proper engineering supervision. Students enrolled in the Urban and Environmental Planning Program receive instruction in creative planning and design, including details in equipment installation, operation, production, and maintenance.

A certificate program in Environmental Control is available through the Woonsocket Area Vocational Technical Facility. The program offers students a basic orientation to general environmental information and technical management skills. Specific training is available in Greenhouse and Nursery Management, Environmental Monitoring, and Land Use Planning.

LEGISLATION

The environmental/energy legislation for Rhode Island was obtained by request from various agency personnel and through various library references. Summaries of the legislation deemed most relevant to the eight subject areas of the workforce assessment were prepared, and are included in the respective state reports. The following list of laws represents virtually all environmental legislation for the state. Only certain of the following laws were summarized; the list is presented to show, by title, the kinds of laws which have been enacted.

Air Pollution Episode Control Act

Clean Air Act

Pesticide Control Law

Radiation Control Act

Solid Waste Law

Water Pollution Control Law

Coastal Resources Management Council Law

National Environmental Energy
Workforce Assessment

Phase I

RHODE ISLAND

State Report

STATE PROFILE

Rhode Island, with 1,214 square miles, is the smallest state in the Union. It is second only to New Jersey in population density, averaging 905.5 persons per square mile in 1970. The 1975 population was estimated to be 927,000. Providence, the capital, is located at the head of Narrangansett Bay. It has a population of 175,000; the metropolitan area includes the entire state.

Manufacturing industries account for $1.9 billion in value added annually. Textile mills formerly employed more persons than all other industries combined. Since 1940 textile workers have declined sharply. Rhode Island leads in the manufacture of jewelry and silverware. Primary metal processing, metal products, machinery, plastics, chemicals, rubber, food processing, and apparel are important industries. The 1975 per capita income was $5,917; slightly more than the national average.

Agriculture employs only 1 percent of the workforce; farm receipts totaled $26 million in 1975. Dairy products and Rhode Island red chickens are the most important products. Potatoes and apples are the largest crops. The commercial fish and shellfish catch is valued at more than $18 million a year. Tourism produces $143 million annually.

The breakout of the sectors of the economy is given below:

Manufacturing	33.7%
Wholesale and retail trade	21.0%
Services	16.3%
Government	15.7%
Finance, insurance and real estate	4.7%
Transportation, communications and public utilities	4.5%
Construction	4.1%

RHODE ISLAND POLLUTION CONTROL AND ABATEMENT AGENCIES

The Rhode Island Department of Health is the principal state environmental agency. The Department has primary responsibility for the air, noise, pesticides, potable water, radiation, solid waste, and wastewater programs. The Department's coordinating branch for the pollution control programs is the Environmental Health Services. The State Energy Office is located in the Governor's Office.

The state's water pollution control program is located in the Division of Water Supply and Pollution Control. It contains an Industrial Wastes and Oil Pollution Section, a Water Quality Section, a Municipal Wastes Section, and an Individual Sewage Section. The Division of Water Supply contains Water Supply, Swimming Pool, and Laboratory Sections.

Air pollution control is the responsibility of the Division of Air Pollution Control which has a Compliance Section and a Technical Services Section. Noise and radiation control are located under the Division of Occupational Health and the pesticides program is located within the Department's Division of Agriculture.

Pollution Control and Abatement Programs

I. AIR

A. Introduction

Air pollution control and abatement activities in the State of Rhode Island are the responsibility of the Division of Air Pollution Control within the Department of Health. Rhode Island has only one Air Quality Control Region, the Metropolitan Providence Interstate AQCR, which has not met the National Ambient Air Quality Standards for Total Suspended Particulates. EPA has called for the state to revise its State Implementation Plan (SIP). The state's principal legislative authority for the abatement and control of air pollution, the "Rhode Island Clean Air Act", states that it is "...the public policy in the State of Rhode Island to preserve, protect, and improve the air resources in the state so as to promote the public health, welfare and safety, prevent injury or detriment to human, plant and animal life, physical property and other resources and to foster the comfort and convenience of the state's inhabitants." The Act charges the Department of Health as the state air pollution control agency.

An "Air Pollution Episode Control Act" was enacted in 1971 as the Legislature found that "...air pollution may at certain times and in certain places so seriously affect the health, safety, and welfare of the people and resources of this state and so directly threaten the lives of large portions of the population as to warrant the provision of emergency powers...to prevent or minimize disasters of unforeseeable proportions." This Act provides the Director of the Department of Health with the authority to advise the Governor when to proclaim an

air pollution alert, an air pollution warning or an air pollution emergency whenever the Director determines that the accumulation of air pollutants in any one place is attaining or has attained levels which could lead to a substantial threat to the health of the people.

B. Workforce Profile

The Division of Air Pollution Control currently has a total staff of eleven persons. Field capabilities are provided by a chief inspector and two field inspectors who are sanitary engineers. The Laboratory Division within the Department of Health provides analytical services for the air pollution program which includes two chemists and two laboratory technicians. The Division is headed by a chief (sanitary engineer) and employs two clerical personnel. The following table depicts the current staffing level of the Division of Air Pollution Control.

TABLE I*

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Air Pollution Control
Current (1976) Staffing Level

Position	1976
Engineer	6
Sanitarian	3
Other	2
TOTAL	11

*Laboratory personnel are not under the jurisdiction of the Air Pollution Control Division and, therefore, are not included in this table.

All of the engineers, including the chief, are sanitary engineers. They have a Masters Degree in either chemical or mechanical engineering.

Personnel are recruited through the State Merit System, but sanitarians/inspectors are primarily recruited from the U.S. Navy. Program officials find that naval boiler tenders are very qualified for monitoring tasks that are performed by the division.

C. Workforce Projections

Air pollution control workforce projections are based on professional estimates of Department of Health officials. Division officials project that the staffing level may increase by 20 percent over the next five years. A vacant sanitary engineering position is anticipated to be filled during 1977 and an additional one or two sanitarians may be recruited to serve as inspectors. It is also anticipated that the Laboratory Division will recruit an additional laboratory aide within the next five years.

Anministrative officials of the Environmental Health Services Unit propose to organize the air pollution personnel into two sections: Compliance and Technical Services. Compliance Section personnel would be responsible for permitting, compliance monitoring and inspections; the proposed staff will be three sanitary engineers and five sanitarians. The Technical Services Section would be responsible for ambient monitoring, standards and planning, and for laboratory services. This section is proposed to be staffed with four sanitary engineers, three sanitarians, four chemists, two laboratory technicians and one laboratory aide.

If the Rhode Island Legislature approves the organizational plan for the Division of Air Pollution Control, the Division could have a total staff of 26 persons in the next five years. The following table depicts possible program growth during the next five years for the division. These projections assume the above reorganization will be implemented.

TABLE II

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Air Pollution Control
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum growth (average)
Engineer	6	7	7	7	8	9	9%
Scientist	0	2	2	3	3	3	50%
Technician	0	2	2	3	3	3	50%
Sanitarian	3	5	6	7	8	8	24%
Other	2	2	3	3	3	3	10%
TOTAL	11	18	20	23	25	26	20%

D. Training and Certification

The State of Rhode Island has a training program for technical personnel in the Department of Health pollution and abatement programs whereby personnel may be sent out of the state for higher level education. Personnel of the Division of Air Pollution Control are often sent to study for Master's degrees in either chemical or mechanical engineering. The state pays tuition and fees and a leave of absence is provided for personnel who participate in this long-term training program.

Rhode Island is one of three states in Region I which have concluded an agreement with EPA for government funds to train instructors in motor vehicle emissions control. Instructors would be trained in specific techniques of motor vehicle emissions testing. They would then be responsible for incorporating these techniques into community vocational high school curricula and into continuing education programs for auto mechanics. Current plans are for the program to be completed by July 1977. The program is being developed with the intent that as the states develop inspection and maintenance programs for antipollution devices on motor vehicles, an adequately trained workforce will be present which can recognize violations of auto emission standards. The necessary corrective actions will then be taken to ensure that all vehicles equipped with pollution control devices meet the federal standards.

Roger Williams College in Bristol offers Associate and Bachelor degree programs in architectural/civil, electrical/mechanical, and industrial management engineering technology. The University of Rhode Island in Kingston has a Civil Engineering program with an environmental emphasis covering air pollution developments.

The Air Pollution Training Institute offered courses during Fiscal Year 1976 in which two persons attended. One person was from the Division of Air Pollution Control and the other from private industry.

E. Career Potential

No new careers are projected by state officials in the field of air pollution for the next five years other than positions being

created for inspection and maintenance of motor vehicle emissions control systems. The state may undergo a departmental reorganization in the next two years and the Division of Air Pollution Control could obtain additional funding for staff increases. The Environmental Health Services Unit within the Department of Health recognizes the inadequacy of the present program structure and has therefore proposed a reorganizational plan to the state legislature. The plan provides for staffing increases within the Division of Air Pollution Control.

F. Conclusion

The Rhode Island air pollution control and abatement program may experience additional growth in the next five years if the proposed reorganizational plan mentioned above is accepted by the legislature. The statewide situation may be otherwise impacted by the enactment of amendments to the Clean Air Act. However, under current conditions, state agency staff growth is expected to be minimal. In the private sector, most potential polluters are either complying or are scheduled for compliance which means that their effort will be one of maintenance. Finally, the future of air programs in the state will depend on federal legislation and support for meeting the guidelines of that legislation.

II. NOISE

A. Introduction

Noise pollution and abatement activities in the State of Rhode Island are performed by the Division of Occupational Health in the State Department of Health. The state has not enacted statewide noise pollution control legislation although the Department of Health presented proposals to the legislature in both 1974 and 1975 sessions. The Department of Health did not present the noise proposal during the 1977 legislative session. An Act was passed, however, in 1976 relating to motor vehicle noise pollution which gave the State Department of Transporation the principal authority to provide monitoring of noise levels on state highways and roads. The Health Department's Division of Occupational Health is primarily concerned with OSHA aspects of noise pollution control and abatement, although the Division assists communities in developing municipal noise ordinances whenever requests are received.

The State of Rhode Island has five communities which have municipal noise ordinances according to an article published in the December 1975 issue of Sound and Vibration. The state has six community nuisance, building, construction, and building noise ordinances as depicted in the following table.

TABLE III

STATE OF RHODE ISLAND

Municipal Noise Ordinances (1975)

City	Nuisance	Zoning	Construction	Building
Cranston	-	X	-	-
East Providence	-	X	-	-
Pawtucket	X	X	X	X
Providence	O	-	-	-
Warwick	-	X	-	-

KEY: X Regulations including acoustical criteria
O Regulations not including acoustical criteria
- No regulations

(Chart excerpted from Sound and Vibration, December 1975. Clifford R. Bragdon, Contributing Editor.)

B. Workforce Profile

The Division of Occupational Health is the principal state agency for the control of noise pollution. The division assists communities in developing noise ordinances and in enforcing occupational aspects of noise pollution problems. Staff are also involved in the protection of the health of industrial workers against occupational exposures to both noise and radiation, and routinely conduct surveys of industries and investigate all employee complaints.

The division has one occupational health specialist specifically designated to work with occupational health problems regarding noise in the state. This person receives support from a division technician who has duties of sampling sites and monitoring them for noise and radiation levels.

C. Workforce Projections

The future for noise pollution control and abatement careers is rather limited since the state has not enacted statewide noise control legislation. However, program officials are confident that it will again be proposed to the legislature in the near future.

Minimal growth in the field of noise pollution control and abatement in the state is expected for the next five years. Division officials project that two additional occupational health specialists may be recruited by 1981. Noise-related duties involving audiometric testing is likely to be a part of their activities. Program officials also project the Division of Occupational Health staff to increase by 50 percent over the next five years. Their duties would include the radiological and audiometric aspects of occupational health. The increase will probably include an additional radiological health specialist and two occupational health specialists.

D. Training and Certification

The Division offers on-the-job training for new staff but the training is informal. One staff member has been promoted as a result of enrichment training. Each staff member can receive, on a one-time basis, a step raise upon successful completion of four job-related courses. Personnel employed by the Division may then continue to upgrade their abilities by taking job-related courses and receive consideration for promotions. The division has no cooperative arrangement with formal training institutions in offering training courses. The division experiences difficulty in recruiting scientific

personnel qualified in the field of audiometric testing and occupational health, because these specialists generally find higher paying positions in the private sector.

E. Career Potential

Division officials expect the future of careers in the field of noise control to improve gradually over the next five years. The Governor of Rhode Island has recently endorsed strict regulations for hiring personnel and the short-term possibility of additional staff being hired is unlikely. Program officials project that the future career potential in the field of noise control will be in the areas of industrial audiometric testing, community noise enforcement and regulating highway noise.

F. Conclusion

Noise pollution control and abatement problems in the state are the responsibility of the Department of Health, Division of Occupational Health. Legislation proposed by the Department relating to establishing noise pollution control legislation for Rhode Island has been repeatedly defeated by the legislature . The legislature has, however, authorized the State Department of Transportation to control noise levels on the state highways and roads through monitoring activities, through the enactment of a regulation in 1976.

The Division of Occupational Health has only one person employed as an occupational health specialist to respond to industrial employees' complaints relating to high levels of noise at their workplace.

III. PESTICIDES

A. Introduction

The Rhode Island Department of Natural Resources is responsible for administering both the state's pesticide control legislation and the plan for certification of pesticide applicators. Its authority is in accordance with Section 4 of the Federal Environmental Pesticide Control Act of 1972. Specific program functions are a responsibility of the department's Division of Agriculture.

The Rhode Island General Assembly repealed the Rhode Island Pesticide Control Law of 1970 and replaced it with the Rhode Island Pesticide Control Act of 1976 (Chapter 191, Public Law 1976). Title 23 of the General Laws of the state were amended by Chapter 23-41.1 under the section titled, "Rhode Island Pesticide Control". The provisions of the Act are to be administered by the director of the Department of Natural Resources. The purpose of the new Act is:

> ...to regulate in the public interest, the labeling distribution, sale, storage, transportation, use and application, and disposal of pesticides...(as) it is essential to the public health and welfare that they be regulated to prevent adverse effects on human life and the environment.

The Rhode Island Pesticide Control Act of 1976 provides for the registration of every pesticide distributed in the state. These registrations are to be renewed annually prior to January 31. The Act was designed to comply with FIFRA and its amendments. The director is authorized to adopt applicator categories which are established by EPA

regulations. The director further specifies sub-categories such as ground, aerial, and manual methods of application. The director also exercises control regarding the use of pesticides to control insects, plant diseases, rodents or weeds. Each category is subject to separate testing procedures and requirements and the director is further authorized to adopt or to prescribe standards of competency for the certification of applicators at least equal to those established by EPA. The Act also provides for:

1) Licenses for Commercial Applicators;
2) Certification of Commercial Applicators;
3) Certification of Private Applicators;
4) Licenses for Dealers of Restricted Use Pesticides and Limited Use Pesticides;
5) Creation of a Pesticide Advisory Board;
6) Unlawful Acts and/or Grounds for Denial, Suspension, or Revocation of a License, Permit or Certification;
7) Storage and Disposal of Pesticides and Pesticide Containers;
8) Enforcement;
9) "Stop, Sale, Use or Removal" Order.

The soon to be established Pesticide Advisory Board will consist of 14 members and the Director of the Department of Natural Resources will serve as chairman of the board. Other members of the Pesticide Board will include:

1) The Chief, Plant Pathologist, and Entomologist of the Division of Agriculture;
2) The Federal Pesticide Coordinator;
3) The Associate Director of the Rhode Island Agricultural Experiment Station;
4) The Director of the Department of Health;
5) The Chief of the Division of Fish and Wildlife;
6) The Chief of the Division of Enforcement;
7) The Chief of the Division of Forest Environment;

8) The Chief of the Division of Coastal Resources;
9) The Director of the Department of Transportation; and,
10) A professional ecologist and aquatic biologist on the staff of the University of Rhode Island, to be appointed by the Chairman of the Board of Regents.

The registration provisions are to take effect on January 31, 1977. The portions of the Rhode Island Pesticide Control Act of 1976 concerning prohibitions for applicators, licensing of commercial applicators and dealers, and certification of commercial and private applicators are to become effective on October 21, 1977. Any pesticide registrations under Title 2, Chapter 9 (Sections 1-28) of the state's General Laws are to remain in effect or be renewed until sixty days after the federal registration process is completed.

The Rhode Island Pesticide Law of 1970 states that it is unlawful to apply, use, sell, transport, or store banned or restricted pesticides unless licensed by the Department of Natural Resources. The Law applies to commercial applicators, non-commercial applicators (users) and special licensees who conduct research and who must be either licensed or certified. A Technical Pesticide Advisory Board was established by the Act to advise the director and to review all rules and regulations prior to their becoming effective. The Board, which presently consists of seven members, is to be replaced by the new 14-member Pesticide Advisory Board.

A "Cooperative Intrastate Service Agreement" was concluded between the Cooperative Extension Service of the University of Rhode Island and the Rhode Island Department of Natural Resources for training and certification of applicators as mandated by the Amendments to FIFRA. The

responsibility for carrying out the educational training component is assumed by the director of the Cooperative Extension Service and the director of the Department of Natural Resources. Applicator training activities are the program responsibility of the University of Rhode Island's Pesticide Coordinator, who is a staff member of the Plant and Soil Science Department. Principal responsibility for the applicator certification program activities has been assumed by the Division of Agriculture's plant pathologist.

According to 1974 Census of Agriculture Preliminary Reports, the state has only 710 farms, of which 501 (71%) are small farms with annual gross sales of less than $20,000. As a consequence, state officials estimate that only about 700 private pesticide applicators will require training.

B. Workforce Profile

Five persons at the Department of Natural Resources are now involved in carrying out the provisions of the state Pesticide Control Act. The director of the Department, the state's principal pesticide control enforcement official, spends approximately 10 percent of the time on pesticide regulatory matters. The chief of the Division of Agriculture has been designated as the principal administrative official for the department and also as the director's representative for the enforcement and implementation of the Act. Twenty-five percent of the chief's time is devoted to pesticide control matters. The division has a plant pathologist who is responsible for administering exams, investigating alleged

violations, maintaining liaison with applicators, developing rules and regulations, registering pesticides, issuing experimental use permits, licensing and certification of dealers and applicators, upgrading and amending the State Plan, and assisting the pesticide coordinator in conducting training programs. Fifty percent of the pathologist's time is spent on these activities. The plant pathologist is assisted by an entomologist with the above described duties.

The Cooperative Extension Service of the University of Rhode Island has four persons responsible for the education training component of the certification process. The director of the Extension Service regulates policies regarding the training and certification program activities. The University's pesticide coordinator, who spends 75 percent of the time in the pesticide training program, cooperates with the federal CES pesticide chemicals program, the EPA pesticide programs and the state pesticide control program. This person is also responsible for the dissemination of information relating to the registration, classification, availability, uses and safe uses of pesticides. He/she also coordinates the training efforts of state and county extension personnel and those organizations whose memberships include applicators who must be licensed or certified. Three county extension personnel are involved with the education efforts for upgrading the competency of applicators. Special emphasis is placed on those applicators who desire state certification. These three county extension personnel spend approximately 10 percent of their time on pesticide education matters.

The division sent out approximately 2,300 notices to commercial and private applicators notifying them that they needed to be trained and

certified. In the latter part of 1976, only 700 applicators responded to the notification and 200 received training. State officials estimated that 400 commercial and 700 private applicators require training and certification in order to comply with the FIFRA requirements.

The division receives the bulk of its funding from state sources, but they did request an EPA grant to hire a secretary to maintain records and assist in the pesticide training and certification effort. The total estimated pesticide workforce is depicted in the following table and includes those persons engaged in the field of pesticides on a full-time or part-time basis.

TABLE IV

STATE OF RHODE ISLAND

Pesticides Public and Private Sector
Current (1976) Staffing Level

Public Sector	1976
Division of Agriculture	5
Cooperative Extension Service:	
State	4
County	3
TOTAL	12

Private Sector	
Private Applicators	700
Commercial Applicators	400
TOTAL	1,100

From Table IV, it is estimated that a total of 1,112 pesticide regulators, educators, and applicators are involved in some aspect of the use of pesticides in Rhode Island. This figure does not include pesticide dealers.

C. Workforce Projections

Workforce projections for the Rhode Island pesticide control activities over the next five years are based on the professional judgements of state program officials. Division of Agriculture officials project that they will hire a field inspector and an enforcement officer to spend half-time with the pesticide control program. Their duties will include inspecting the premises of dealers and applicators, investigating alleged violations, assisting in enforcement actions, assisting in accumulating data pertinent to the activities of the certification program, cooperating with the Extension Service, and assisting the division's plant pathologist. Through the implementation of an inspection and field surveillance program, the state intends to assure that certified applicators comply with standards for use and application of restricted use pesticides. The anticipated inspector will conduct spot checks of applicators and use situations to determine that certification, supervision and use requirements are being met adequately.

D. Training and Certification

The Rhode Island Pesticide Control Act of 1976 requires that all certified applicators must renew their certificates by filing an annual renewal application within sixty days of the expiration date of the

certificate to maintain active status. The regulations further require that all certified applicators attend at least one pesticide applicator training program within five years to become acquainted with changes that have been made in technology and regulation. Each applicator who attends prescribed training programs will be issued a certificate of attendance, a copy of which is to be maintained by the state. Certified applicators who fail to meet the course requirement will be required to take another examination before their certificates will be renewed.

The Division of Agriculture does not offer a formal in-house training program for pesticide regulatory personnel since the program is small. Personnel are encouraged to attend seminars and short courses to upgrade their skills and to remain knowledgeable of current developments. The current private applicator training, conducted by the Cooperative Extension Service of the University of Rhode Island, consists of a three and one-half hour training film and distribution of a Study Booklet for Pesticide Applicator Examinations. The study booklet is prepared by the Department of Natural Resources, Division of Agriculture, with the assistance of Porfessor J. Lincoln Pearson, Pesticides Coordinator, from the University of Rhode Island's Plant and Soil Science Department. The booklet is divided into five parts which are as follows:

Study Booklet for Pesticide Applicator Examinations

Contents

Part A: The law and its purposes.
Label importance and interpretation.
Restricted use pesticides.
Safe pesticide storage.

Part B: General safety precautions-handling, preparing and using pesticides. Environment Protection.

Part C: The safe use of pesticides.

Part D: Equipment calibration.

Part E: Computations - spray preparation and application rates.

After the private applicators have viewed the training film, which is based on the manual, they are to come back to the training site for a one-day session to take the four-part private applicator certification examination.

The commercial portion of the training consists of the applicators first coming to the training center for a half-day of training and to pick up their manuals. They return about two weeks later for additional training and take the examination.

E. Career Potential

Other than the two positions previously described, the Division of Agriculture's pesticide program staff is not likely to recruit significant numbers of personnel for their regulatory program. Because there is a stringent training program and certification requirement for private applicators, a decrease in the numbers of certified private applicators is likely over the next five years, and a corresponding increase in the numbers of commercial applicators is likely to develop. The continual five-year training requirement may be a major reason why the number of private applicators is likely to decrease in favor of

commercial applicators. The risks of misuse and the incumbent penalties are other reasons why there is likely to be a decrease in private certified applicators.

F. Conclusion

The Division of Agriculture is likely to place its primary enforcement and training emphasis on pesticide dealers since Rhode Island requires that restricted use pesticides can only be shipped to licensed dealers and certified applicators. Before selling a restricted use product, pesticide dealers are required to fill out a three-part form which includes the name of the pesticide, the EPA number, and the amount. All certified applicators are to keep and maintain operational records of the kinds, amounts, dates, and places of application of "restricted-use" and "state limited use" pesticides for two years.

The Rhode Island Pesticide Control Program lacks workforce and communications with the state pesticide applicators and dealers at the present time. Although the state program plans to recruit an inspector to compel those who are uncertified or licensed to comply with the federal and state laws, it will be difficult for one person to locate every pesticide dealer and applicator under these conditions.

IV. POTABLE WATER

A. Introduction

Potable water pollution control and abatement activities in Rhode Island are the responsibility of the Division of Water Supply within the Department of Health. Rhode Island has a total of ten water treatment plants, and three have a capacity of over five million gallons per day. The water treatment plant which serves Providence has a capacity of over eight million gallons. According to a list developed in 1975 of water supply systems in the state, there are a total of twenty-one municipal systems, including distribution systems. A Rhode Island Water Resources Board has the responsibility of developing additional sources of water supplies and assists in the financing of additional water supply resources by providing for interest-free developments.

The state program is moving toward assumption of primary enforcement responsibilities for the Safe Drinking Water Act (SDWA), but the program lacks both adequate staff and a program for certifying water treatment plant operators at the present time. If the Division of Water Supplies assumes primacy over the federal Act, the state drinking water program can be expected to double in size.

B. Workforce Profile

The Division of Water Supplies, which is an administrative arm of the Rhode Island Department of Health, is headed by an assistant director of Environmental Health Services. The assistant director is also the acting chief for the Division of Water Pollution Control. The

Division of Water Supply has principal responsibility for performing the following functions:

1) Monitoring of all public water supplies;

2) Approval of plan specifications for water supply systems; and,

3) Assuring safety of Rhode Island's drinking water.

The division presently has a staff of eight for water supply program activities, although the staff of the water pollution control and the water supply program often support division activities. The division, according to the state classification system, has a principal sanitary engineer, a sanitary engineer, one senior sanitarian, two sanitarians and two clerical personnel. The director is also an engineer. Laboratory support is provided by the Department of Health Laboratory Division staff which has a principal chemist, two sanitary chemists, two microbiologists, two laboratory technicians and two sanitary aides. Sanitarians are assigned to inspect water treatment plants and collect samples. If thorough inspections are required, they are usually performed by the sanitary engineers. The positions, formally attached to the Division of Water Supply, are depicted below.

TABLE V

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Water Supply
Current (1976) Staffing Level

Position	1976
Engineer	3
Sanitarian	3
Other	2
TOTAL	8

Rhode Island does not have a certification program for water plant operators and specific numbers of operators in the state were not available. At this time, certification is a voluntary action on the part of the operator.

C. Workforce Projections

The Division of Water Supply is currently operating under interim regulations developed by EPA for the period prior to enactment of the SDWA. It is difficult for state program administrators to project specifically how many additional personnel will be required over the next five-year period to carry out the provisions of the Act. According to projections by division administrators, the state program will require an additional sanitary engineer and three to four sanitarians in the next two years to perform the tasks that are required to assume primacy for the Act.

The Rhode Island program received, for Fiscal Year 1976, a total of $101,000 for implementation of SDWA. The state share of the funding amounted to $26,000 and the federal share was $75,000. EPA also awarded a total of $170,600 for Fiscal Year 1977 to help the state establish and administer state drinking water supply programs compatible with the Act. The federal funds will be used to:

1) formulate and adopt state drinking water standards, at least as stringent as the federal standards developed by EPA;

2) adopt a program to certify laboratories performing drinking water analyses;

3) conduct surveillance programs;

4) review the design, construction, or modification of drinking water facilities;

5) establish enforcement programs to assure the proper performance of drinking water supplies; and,

6) set up and operate data-keeping and reporting systems required by EPA regulations.

Program officials have projected that they will require approximately $216,000 in funding for Fiscal Year 1978 and about sixteen person-years for the implementation of the federal Act. The projection was made with the assumption that the sixteen person-years for 1978 were for work performed with community systems throughout 1978, and no allowances were made for staff required to handle non-community systems. Officials feel that the likelihood of obtaining the workforce by FY 1978 is rather narrow; a more realistic estimate of that year's workforce may be twelve. Five-year projections for the divisions are depicted in the following table.

TABLE VI

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Water Supply
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	3	3	4	4	5	5	n/a	12%
Sanitarian	3	3	5	7	8	8	n/a	24%
Other	2	3	3	3	3	4	n/a	17%
TOTAL	8	9	12	14	16	17	n/a	17%

The Environmental Health Services, which has administrative authority for the Divisions of Water Pollution Control and Water Supply, requested approval from the Rhode Island General Assembly to hire one sanitary engineer and three to four sanitarians for Fiscal Year 1977 program operations. The General Assembly, currently meeting in its regular annual session to consider the budget for 1977, has denied the request.

D. Training and Certification

The Division of Water Supply relies on the U.S. Environmental Protection Agency for staff training. The Department of Health offers no formal in-house training program for new recruits and most of their training is on-the-job. Upgrade training is considered to be a real need by Division administrators since there are no water supply training courses available in the state. As there is no requirement for certification of water treatment plant operators in the state, there is little available in the way of training for these operators.

E. Career Potential

Career potential for water supply program activities over the next five-year period in Rhode Island is likely to remain rather limited due to the small size of the program. However, the size of the Division of Water Supply is anticipated to more than double in staffing level over the next five years due to the requirements of the Safe Drinking Water Act. Career potential for state service in the state is expected to improve for sanitary engineers and sanitarians and when the state

develops a certification program for water treatment plant operators, the potential demand for skilled operators is likely to increase.

F. Conclusion

The Division of Water Supply is expected to double its present staff over the next three to five years in order to carry out adequately the mandates of the new Federal Safe Drinking Water Act of 1974. The division does not now possess the staff or resources to assume primacy for the Act, although it has expressed an intent to EPA to begin procedures for assuming primacy.

Rhode Island does not now have a certification program for assuring that water treatment plant operators have the necessary skills to operate water treatment plants effectively. Moreover, training resources available in Rhode Island for conducting training are limited at present. If drinking water supplies are to be properly and safely maintained by well-trained water plant operators, EPA will have to take steps to remedy this training deficiency, as the state lacks the resources to do so.

V. RADIATION

A. Introduction

Radiation control activities in the State of Rhode Island are the responsibility of the Department of Health, Division of Occupational Health. The Division of Occupational Health has both radiation and noise program responsibilities at the present time. Rhode Island passed its permissive state statute authorizing a federal/state agreement for the control of certain Nuclear Regulatory Commission-controlled materials in 1964. Most of the Division of Occupational Health's radiation control activities concern registering and monitoring of radiological health equipment such as medical and dental X-ray machines, although the legislature passed legislation in 1976 authorizing emergency response planning and creating an environmental program surveillance network.

Environmental radiation control has become a public concern as the New England Electric Company is planning the construction of two Charlestown nuclear power sites, each of 1,200 megawatt capacity, to be completed in 1984 and 1985. United Nuclear Corporation operates a nuclear scavenging operation which recovers scrap from the ore used in the manufacture of fuel rods for nuclear reactors. The University of Rhode Island operates a 2 megawatt thermal research reactor for its educational training activities.

B. Workforce Profile

The Division of Occupational Health has a total staff of eight persons for their radiation and noise control program activities. The staff are interchangeable between both programs but there are occupational health specialists designated for both areas. The division technical staff are responsible for assisting both programs. The division also has one chemist assigned to perform occupational health work, as is one chemist in the Division of Laboratories in the Department of Health. The Division of Occupational Health chief (administrator) is a physician and has been working in the field of occupational health since 1936. The division has recruited, using CETA funds, a laboratory aide to assist the division's radiological and occupational health specialists. The division also has a technician assigned to tasks such as sampling and monitoring noise and radiation levels throughout the state. The staff seeks to assure the health of industrial workers against occupational exposures by performing routine surveys of industries and investigating all employee complaints involving occupational health hazard exposures. The division has access to two of the Department of Health attorneys for enforcement of violations of the state regulations concerning occupational health matters.

The following table depicts the current distribution of staff employed on a full-time basis with the Division of Occupational Health for both noise and radiation program activities.

TABLE VII

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Occupational Health
Current (1976) Staffing Level

Position	1976
Administrator	1
Radiological Health Spec.	1
Occupational Health Spec.	1
Chemist	1
Technician	2
Clerical	2
TOTAL	8

One chemist and one assistant radiological and health specialist (CETA) have been assigned to work in the Division of Laboratories on occupational health (radiation and noise control) matters.

C. Workforce Projections

Workforce projections for the Division of Occupational Health are based on the best available estimates by radiation program officials. They estimate that the division's radiation control workforce will increase by one person with the possible recruitment of one additional radiological health specialist. Two additional occupational health specialists are likely to also be recruited to increase the total to eleven by 1982. The Division of Occupation Health experiences an average annual turnover rate of nearly 10 percent. The Division has lost an occupational health nurse, a radiological health specialist and a secretary through employee retirement. The division has experienced difficulty in replacing these personnel due to a hiring freeze on the state departments and agencies.

D. Training and Certification

Most of the staff training offered for personnel of the Division of Occupational Health is on-the-job and in-house. Training of a formal nature is not offered due to the limited size of the division and the department. Employees can earn a step increase in pay whenever they have completed four environmentally related courses at an accredited college or university. The pay increase can only be earned once during an employee's period of employment with the Department of Health. The department does encourage personnel to upgrade their professional abilities through continuing education course attendance. Promotion is often considered if the courses attended are mutually beneficial to both the department and the employee.

Division of Occupational Health professional personnel participate in courses that are offered by the Harvard School of Public Health in basic radiation measurement and planning for nuclear emergencies. These are two short courses that are EPA-funded through an interagency agreement with the Nuclear Regulatory Commission. Both of these courses are oriented to providing instruction for health physicists. The Short Course in Basic Radiation Measurement is a one-week course which has been designed to meet the requirements of training in the fundamentals of radiation training for personnel employed at nuclear facilities, industrial installations, medical and research installations and research laboratories. The other course entitled A Short Course in Planning for Nuclear Emergencies is a one-week course designed to provide coverage of standards for emergency action whenever accidents

involving the use of nuclear materials occur. The course is for personnel employed by public utilities, regulatory agencies, and taught by law enforcement, civil defense and disaster-control agencies.

E. Career Potential

Career potential for radiation protection personnel employed by the state in environmental radiation monitoring and emergency response planning activities is limited since the Department of Health has placed a relatively low priority on the program. The division receives a small amount of funding from the department which precludes additional hiring. When the two nuclear power reactor units at Charleston are completed in the next five to seven years, the career potential for health physicists is likely to improve.

F. Conclusion

The State of Rhode Island's radiation control program is primarily concerned with registration and inspections of X-ray equipment at the present time. Rhode Island is not an agreement state with the Nuclear Regulatory Commission and the State Department of Health has placed a low priority on environmental radiation control, so it is unlikely that the state radiation workforce will experience significant growth.

VI. SOLID WASTE

A. Introduction

Solid waste management program activities in Rhode Island are the responsibility of the Division of Solid Waste Management which is in the Department of Health. Principal legislative authority for the Division's operations are found under Chapter 23 of the General Laws of Rhode Island passed in 1956, and later amended. The state adopted rules and regulations for solid waste management facilities in 1975 to minimize environmental hazards which are associated with the operations of solid waste transfer, resource recovery and disposal facilities. In 1975, the state also adopted rules and regulations developed by the Department of Health establishing licensing procedures for all solid waste management facilities.

According to a survey recently conducted by the magazines Solid Waste Systems, (October/November, 1976), the State of Rhode Island has a total of 33 sanitary landfills of which 22 (67%) are publicly owned and 11 (33%) are privately owned. Most of the state's solid waste management activities are handled by either sanitary landfills or incinerators. Rhode Island also has six to seven transfer stations at strategic points across the state. There are three incinerators in the state which are either municipally owned or are small, private, non-conventional incinerators with limited capacity. Residues from the state's only municipally owned incinerator in Pawtucket are landfilled. The state's other two remaining smaller incinerators are privately owned.

The state has a total of 39 communities but only six to seven collect their own wastes. Nineteen communities have no collection agencies and ten of these provide such services through a contractual arrangement with private landfill companies. Commercial and industrial wastes are also collected by private companies and are disposed of in privately owned landfills. The Division of Solid Waste Management is encourageing a regionalization of landfills by offering state grants to communities willing to create regional landfills with neighboring communities.

In 1974, the Rhode Island General Assembly created a Rhode Island Solid Waste Management Corporation to plan, design, construct, finance, manage, own, operate and maintain transfer stations, waste processing facilities, resource recovery facilities, and all other solid waste management facilities which are considered necessary by the Corporation to carry out the provisions of the Solid Waste Management Plan. The Corporation provides services to municipalities and to the state's citizens by receiving solid wastes at the corporation facilities through a contractual arrangement with the users. The corporation is to generate revenues to support its operations from the user fees and by resource recovery operations.

The ultimate objective of the corporation is to maximize resource recovery, recycling, and reuse throughout the state. Seven commissioners compose the corporation, four of whom are appointed by the Governor, two by the Speaker of the House and the one remaining member is appointed by the Senate Majority Leader. The commissioners are assisted by an eleven-member Citizens Advisory Board, all of whom are appointed by the Governor.

The corporation has contracted for disposal purposes with three cities who in turn negotiate with private landfill owners. The cities are Barrington, Pawtucket and Warwick. The corporation has contracted to collect reclaimed materials at least once a month from each of these cities, surcharging the user thirty cents.

The Division of Solid Waste Management has recently completed a hazardous wastes management report which includes a list of about 300 hazardous waste generators in Rhode Island. It lists the type of hazardous wastes generated, the amounts and the sources of such materials. The survey points out that Rhode Island does not have adequate legislation for the regulation and disposal of hazardous wastes materials. In response to the preceding, the department plans to introduce enabling legislation to the General Assembly in its next session. The type of program will depend on what guidelines are formulated by EPA under the mandates of the Resource Conservation and Recovery Act of 1976. If the division is required to develop a manifest system to provide for disposal of refuse, the division's staffing level is anticipated to be impacted. There is unlikely to be as much growth in the division's staffing level if the Region I states create a hazardous wastes disposal facility accessible to all Region I states.

B. Workforce Profile

The Division of Solid Waste Management has a total staff of five persons at present and a total operating budget of $94,000 for Fiscal Year 1976, of which half is provided by EPA grants. The division has three engineers, a sanitarian and a secretary. Two of the engineers

have degrees in civil and chemical engineering and the third, a sanitary engineer, has a degree in civil engineering and in the soil sciences. The division sanitarian has an associate degree from a technical institution. The following table depicts the current staffing level of the Division of Solid Waste Management.

TABLE VIII

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Solid Waste Management
Current (1976) Staffing Level

Position	1976
Engineer	3
Sanitarian	1
Other	1
TOTAL	5

Each of the state's thirty-three sanitary landfills are estimated to have at least three persons working at them. The publicly owned incinerator at Pawtucket may have twenty-five employees. Each of the two smaller privately owned incinerators have at least two persons employed to operate them. The six to seven privately owned transfer stations each have at least three persons running their operations. It is estimated that there are approximately 200 persons in the state, excluding collectors, involved in solid waste management activities.

C. Workforce Projections

Workforce projections for solid waste management program activities for the next five years are based on the professional judgements of the

Division of Solid Waste Management administrative officials. The division officials anticipate that the new federal Resource Conservation and Recovery Act of 1976 (RCRA) will significantly impact the division's future staffing level. Program officials were unable to fully develop their plans since EPA has yet to develop rules and regulations regarding implementation of the Act.

If the state is required to adopt a manifest system disposal facility for management on a statewide basis of hazardous wastes materials, the division is projected to increase by an additional four persons. The increase in personnel would probably involve an additional secretary, two chemical engineers and a sanitarian. As the state has not enacted comprehensive legislation authorizing the Department of health to develop a hazardous wastes management plan, it is considered unlikely that the additional personnel could be recruited earlier than 1978.

The following table depicts workforce projections for the Division of Solid Waste Management.

TABLE IX

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Solid Waste Management
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	3	3	4	5	5	5	n/a	12%
Sanitarian	1	1	2	2	2	2	n/a	20%
Other	1	1	2	2	2	2	n/a	20%
TOTAL	5	5	8	9	9	9		15%

There is expected to be a decrease in numbers of sanitary landfills in Rhode Island due to the gradual phasing out of community landfills in favor of regional landfills. There is expected to be a corresponding decrease in the numbers of landfill personnel employed at these landfills. If there is to be any increase in the number of landfills due to non-participation in the regionalization process, the growth in numbers of landfills in the state might be five or six.

D. Training and Certification

Most of the training obtained by division employees is on-the-job since there is no formal training program available for them. Staff are sent to technology transfer seminars or other types of short-term training sessions and conferences whenever the Division staff see some possible benefit to their operations. Such programs will be attended only if the program is within a reasonable distance from Rhode Island.

As EPA provides limited training in the area of solid waste management, the state must pay for its own travel and training if the need arises. The state does not offer any training in the operation or management of sanitary landfills or hazardous wastes for local landfill operators. The division relies heavily on EPA for both technical training and regulations development support.

Staff from the Division of Solid Waste Management recently attended the Source Separation Conference in Hartford, Connecticut jointly sponsored by the Connecticut Department of Environmental Protection and EPA in March 1977. Officials from both agencies held the conference to discuss the economics of source separation, methods, markets, and public

education. The conference was oriented to municipal solid waste officials and interested members of the public. Another program was sponsored by the Division of Solid Waste Management and the University of Rhode Island. It was a one-day seminar on sanitary landfills and the problem of leachates. The University's Civil Engineering Department and one person from the division conducted the seminar.

E. Career Potential

Division officials consider the career potential for careers in the field of solid waste management to remain limited over the next five years. The state program is expected, like many other state programs, to be affected in terms of rapid growth by the new federal legislation regarding hazardous waste management.

All of the solid waste management programs, according to division sources, are increasingly dependent on EPA for both funding and training resources. The Rhode Island General Assembly, not unlike other state legislatures, is reluctant to initiate new federal programs without federal support. The most promising field in solid waste management appears to be in chemical engineering. Both the industries generating the hazardous waste materials and the state regulatory program are expected to recruit additional chemical engineers in the next five years.

F. Conclusion

Future growth in the area of solid waste management in Rhode Island is dependent on federal initiatives. There is very little training available for solid waste management personnel so the Division staff is

dependent on EPA training, and those short-courses and conferences occasionally offered in the area. The state program is further constrained by limited funds and restrictions on travel. The new federal RCRA is expected to impact staffing levels over the next five years. If the state is required to initiate a manifest system for the management and disposal of hazardous wastes, the state program can be expected to increase from the present level of five persons to nine by 1982.

VII. WASTEWATER

A. Introduction

Wastewater pollution control and abatement activities are the primary responsibility of the Division of Water Pollution Control within the Rhode Island Department of Health. The Health Department Laboratory Division is utilized for analytical purposes by both the water supply program and the water quality program. According to a recent report issued by the EPA Region I office, 64 percent of Rhode Island's major rivers and tributaries are now suitable for fishing and swimming. Rhode Island has the highest percentage of major rivers in the Region meeting federal fishable/swimmable standards as outlined in the Federal Water Pollution Control Act of 1972. Acceptable state water quality standards are now being met by 92 percent of the state's river miles. The construction grants program and permitting activities have been cited by the Regional Office as the primary reasons for such progress being made. The EPA report further estimated that by 1983, 71 percent of the major river miles will be fishable/swimmable.

Rhode Island still has room for considerable progress toward the achievement of the nationwide water quality goals. High coliform levels still exist in the Pawcatuck, Blackstone, Pawtuxet, and Providence Rivers. Serious water pollution problems exist in the Blackstone River in the Providence area primarily because of combined sewer overflows and urban run-off. Ninety-two percent of the Narragansett Bay has been classified by EPA as being suitable for bathing purposes along the coast. Dissolved oxygen violations have occurred in the Pawtuxet and Pawcatuck Rivers and, throughout the state, many pH violations have been reported.

In 1973, the U.S. EPA, under the Construction Grants Program, made approximately $90 million available to the state for supporting surface water pollution control projects. According to EPA reports the state, as of January 1, 1977, obligated $64 million for construction projects and has about $26 million (29%) remaining to be allocated by September, 1977. The state program deserves credit for its rapid processing, reviewing of grants and for being active in carrying forward the construction grant program.

Rhode Island has not, as of yet, assumed any primary responsibilities under the construction grants program or the NPDES permit program. It has adopted a regional approach in encouraging its communities to use common wastewater treatment facilities wherever possible. The communities of Burrillville, Smithfield, Jamestown and New Shoreham are currently constructing new facilities, and Narragansett and South Kingston are constructing regional facilities. Woonsocket, Warren, Bristol, Newport and Westerly are communities which are currently served by primary treatment facilities but are expected to be upgrading their facilities to secondary treatment.

The state received a total of $417,000 from the U.S. EPA for Fiscal Year 1977 to assist the Department of Health's water pollution control program in establishing and maintaining adequate standards for the prevention and control of water pollution. The grant is expected to be used for such activities as planning and surveillance, enforcement, training and assistance to local agencies. The entire state has been designated responsible for the planning required under the "208" Program. The Division of Water Pollution Control will carry out these planning efforts.

B. Workforce Profile

Table X depicts the current staffing level of the Division of Water Pollution Control, excluding laboratory personnel and five part-time college student sanitarians who work in the division during the summers. Laboratory support consists of one principal chemist, two sanitary chemists, two microbiologists, two laboratory technicians and two sanitary aides.

TABLE X

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Water Pollution Control
Current (1976) Staffing Level

Position	1976
Engineer	13
Biologist	1
Sanitarian	3
Other	3
TOTAL	20

The engineers consist of four principal sanitary engineers, four senior sanitary engineers, four sanitary engineers, and the division chief who is a supervisory sanitary engineer. Positions included in the "Other" category include an accountant and two clerical staff members. The division also has access to a legal counsel from the Department of Health.

Rhode Island has a voluntary certification requirement since legislation requiring mandatory certification has repeatedly failed to pass during the last several annual sessions of the General Assembly.

The voluntary certification examinations are administered by the New England Interstate Water Pollution Control Commission.

The state has a total of thirty-three wastewater treatment plants including many small facilities which are located in such places as shopping centers. It does not have a classification system but divides these plants into minor and major categories. Included in the total are ten major municipal sewage treatment facilities, eleven minor sewage treatment plants and two commercial small development sewage treatment plants.

In May, 1975, the Division of Water Pollution Control published the results of a survey of wastewater treatment plant facilities. This survey assesses the existing workforce levels at these facilities and projects their workforce needs. The title of the publication is "Estimate of Manpower Needs for New and Expanding Municipal Wastewater Treatment Facilities, May, 1975". State program officials still consider the document to be valid two years later as a means of portraying the current wastewater treatment plant staffing levels.

The following table presents a summary of existing levels of staffing (1975) at municipal wastewater treatment facilities.

TABLE XI

Municipal Wastewater Treatment Facilities
1975 Staffing Level

Position	1975
Supervisory	24
Operation and Maintenance	175
Laboratory	11
Clerical	12
TOTAL	222

C. Workforce Projections

Workforce projections for wastewater pollution control and abatement activities in Rhode Island are based upon professional judgments of the Department's Environmental Health Services administrative personnel. Such administrators have indicated that two sanitary engineering positions have been requested from the Rhode Island General Assembly for FY 1977. Approval for the hiring of the requested positions was not granted for FY 1977, however, and the request will be renewed for FY 1978. Additionally, the Division of Water Pollution Control is anticipated to request from future General Assemblies a senior aquatic biologist and a sanitary engineer. The projections are depicted in the following table, but they exclude projections for laboratory personnel as they are under the jurisdiction of a separate Division within the Department of Health:

Table XII

RHODE ISLAND DEPARTMENT OF HEALTH

Division of Water Pollution Control
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	13	13	15	15	16	16	n/a	4%
Biologist	1	1	1	2	2	2	n/a	20%
Sanitarian	3	3	3	3	3	3	n/a	0
Other	3	3	3	3	3	3	n/a	0
TOTAL	20	20	21	23	24	24	n/a	5%

Projected needs for wastewater treatment plant operators in the State of Rhode Island are based on the assumption that the activated sludge process will remain the principal method of treatment over the next five-year period. Additional wastewater treatment plant personnel will continue to be needed by Rhode Island communities to supervise, operate and maintain wastewater treatment facilities.

It has been estimated by the Division of Water Pollution Control that between the years 1975 and 1983, approximately 100 new wastewater treatment plant personnel will be needed for plant staffing in Rhode Island. The actual recruitment of personnel is dependent upon the rate at which wastewater treatment facilities are constructed in the state. The projections are in addition to those that are expected to replace existing staff through relocation or retirement. Program officials estimate that there will be about twenty-five new operator entries each year and about five persons needing upgrade training annually.

D. Training and Certification

The Division of Water Pollution Control is severely limited in both training for present staff to upgrade staff abilities and in training provided to wastewater treatment plant personnel. Most of the training received by the division's professional staff is on-the-job, but staff are encouraged to attend outside training courses offered by universities in the area. The division has no program for offering long-term training for its personnel, but staff can receive a step pay raise if they attend four job-related courses on their own time. The division is therefore forced to rely primarily on EPA to meet its training needs. However, courses offered through the EPA Office of Water Program Operations at the National Training Center in Cincinnati, Ohio, are rarely attended by division personnel because of travel restrictions. According to estimates made by division personnel, Rhode Island has sent only two persons in the last eight years to Cincinnati.

Division staff attend courses offered by the University of Rhode Island at Kingston pertaining to sewage and sanitary chemistry. Roger Williams College in Bristol also offers day or evening courses leading to a Bachelor of Science degree in engineering. It is offered by the College's Urban and Environmental Planning program which places special emphasis on environmental engineering problems in pollution, water supply and sewage.

The Lincoln Davies Vocational Technical School in Providence offers a continuing education program for operators with instruction

provided for basic operating techniques. Approximately eighteen students attend this basic course which is offered once a year. The course is entitled "Wastewater Treatment Plant Operator Training Course in Process Control Technology" and is jointly sponsored by the Rhode Island Department of Health and the Department of Education.

An operator training school in South Portland, Maine, is supported by all of the New England States, including Rhode Island. The course is designed to provide training in wastewater treatment technology and is a nine-month special wastewater operator short course offered by the Southern Maine Vocational Technical Institute and the New England Regional Waste Water Institute. In the eight years that the course has been offered, only two prospective operators have attended the training school, according to Rhode Island officials.

It is evident from the sparse list of training programs which are being offered in Rhode Island that wastewater treatment plant operators definitely require training courses to be offered on a more frequent basis for these operators to be most effective in properly operating treatment plants. A greater emphasis in providing training resources in Rhode Island should receive the attention of EPA if the treatment plants currently being constructed and upgraded in the state are to be properly operated in the next five-year period.

E. Career Potential

Program officials in Rhode Island foresee a need in the next five years for sanitary engineers and sanitarians in the field of wastewater pollution control and abatement. There is also likely to develop a greater career potential for wastewater treatment plant operators.

F. Conclusion

The Division of Water Pollution Control has primary emphasis on the processing of grants for the construction grants program. Both the Division of Water Pollution Control and the Division of Water Supply utilize Department of Health laboratory personnel for analytical purposes. The staffing level of the Division of Water Pollution Control is expected to increase by five positions from the present level of twenty persons devoted exclusively to wastewater treatment plant personnel. The availability of training resources for both the division's staff and operators is a very critical need that has been identified by program officials. Operator training and certification will also continue to be a problem until the state enacts a mandatory certification law.

VIII. ENERGY

Rhode Island's State Energy Office was created by an Executive Order of the Governor in May 1975. The office is to manage the state set-aside program of petroleum supplies and to initiate programs related to energy conservation and resource development. Other major programs include:

1) Information Systems: assisting in the development of the New England Energy Management Information System.

2) Power Plant Siting: cooperating with the Public Utilities Commission relative to energy facilities siting.

3) Refinery Siting: cooperating with the Governor's Council on Energy Resources relative to outer continental shelf development.

The New England Electric Company is planning to construct two nuclear power sites at Charlestown, Rhode Island, each of 1,200 megawatt capacity, to be completed in 1984 and 1983. United Nuclear Corporation also operates a nuclear scavenging facility which recovers scrap from the ore used in the manufacture of fuel rods from nuclear reactors.

The Rhode Island Energy Office is currently planning a reorganization of its functions into other state agencies. It is not clear at this time just what effect a reorganization will have on the office but it is primarily involved with energy allocations at this time.

The office has one administrator who is responsible for energy conservation and another who is now attached to the Governor's Office who is involved with research and development programs. This person is attached to the Governor-appointed Energy Advisory Council.

The State Energy Office currently has a total staff of six persons, but due to reorganization and shifting of functions, it is not possible to project what the Office's staffing level may be by 1982.

Selected Post Secondary Institutions With Formal Environmental Energy Programs

Relatively few comprehensive environmental career options are available through the post-secondary educational institutions in the State of Rhode Island. Roger Williams College, a small liberal arts college, located in Bristol, Rhode Island, offers degrees in both Urban and Environmental Planning and Power Engineering Technology. The Urban and Environmental Planning Program is a Bachelor of Science degree program. The four-year program offers the student a sound background in both the basic scientific and mathematic technology skills as well as a broad-base exposure to environmental engineering and management techniques. This program was implemented in 1973.

The Power Engineering Technology Program offers an Associate in Science degree. The program is designed to prepare a student to become skilled in the management of energy conversion. The student is trained to maintain and operate equipment essential to power generation, heating, ventilation, humidity control, air conditioning in industrial plants, institutions, and other building complexes. Upon graduation the student is also qualified to perform the duties of an engineering technician, estimator, designer, planner, inspector, and tester of engineering equipment; however, it is recognized that in the performance of these jobs, the graduate will require proper engineering supervision and direction.

The Woonsocket Area Vocational Technical Facility at Woonsocket, Rhode Island offers a certificate program in Environmental Control. The program which was instituted in 1976 offers the student general courses in basic ecology, population, weather, and plant science. In addition to these

fundamental core offerings, the student may elect to enroll in such technical courses as Propagation of Trees and Shrubs, Greenhouse Management, Nursery Management, Environmental Monitoring, and Land Use Planning.

Other post-secondary educational institutions in the state offer select environmental courses in ecology, meteorology, and engineering techniques; however, other than the two colleges previously mentioned, career options in environmental occupations are scarce.

The following section in this report will provide a basic review of the programs available through Woonsocket Area Vocational Technical Facility and Roger Williams College. The review will include statistics on student enrollment, degree requirements, and course offerings.

SENIOR INSTITUTIONS

Roger Williams College
Bristol, Rhode Island

Program: Urban and Environmental Planning (B.S.)

Hours required for major: Semester - 38 units
Program Inception: 1973
Staff Size: Two instructors (2 M.S.) plus support from staff in other college departments.
Enrollment: 32
Graduates (1976): 0
Placement: 0
Graduate Work: 0

Courses

Architectural Drawing I, II
Concepts of Ecology
Technical Communications
College Algebra
Biology 102 and Lab
Trigonometry and Analytical Geometry
Introduction to Political Power
Fundamentals of Accounting I
Principles of Economics I
Environmental Chemistry I, II and Lab
Business Law I, II
Biology Requirement
Environmental Economics
Urban America 336
Environmental Engineering
Freshwater and Estuarine Ecology and Lab
Engineering Statistics
Transportation Engineering
Surveying I, II
Environmental Management
Problems in Pollution
Construction Estimating
Urban Planning I, II
Regional Analysis
Sociology of Community
Energy Crises
Community Power Structure
Water Supply and Sewerage
Senior Project Seminar in Urban Design

COMMUNITY COLLEGES/TECHNICAL INSTITUTIONS

Woonsocket Area Vocational Technical Facility
Woonsocket, Rhode Island

Program: Environmental Control Curriculum (Certificate)

Hours required for major: Semester - 6
Program Inception: 1976
Staff Size: One instructor (1 M.S.)
Enrollment: 40
Graduates (1976): 0
Placement: 0
Graduate Work: 0

Courses

Ecology
Limnology
Terrestrial Ecology
Soil Ecology
Population
Propagation of Trees and Shrubs
Greenhouse Management
Nursery Management
Natural Resources and Resource Use
Plant Science
Forest and Animal Resources
Environmental Monitoring
Land Use Planning
Weather
Occupational Investigation

State Legislation

RHODE ISLAND AIR

TITLE:

Air Pollution Episode Control Act
Rhode Island Laws 23-25.1-1

PURPOSE:

To provide for emergency powers to minimize health and safety hazards during severe air pollution periods.

DEFINITIONS:

1. Air contaminant
2. Air pollution
3. Area
4. Director
5. Person

ADMINISTERING AUTHORITY:

Department of Health
Division of Air Pollution Control

AUTHORIZATIONS:

To recommend declaration of air pollution emergencies;
To restrict transportation, commercial, industrial and other air polluting activity;
To enforce the act.

PROHIBITED ACTS:

To violate or fail to comply with any emergency order.

PENALTIES:

Fines of up to $500 or 90 days imprisonment.

RHODE ISLAND AIR

TITLE:

Clean Air Act
Rhode Island Laws 23-25-1

PURPOSE:

To preserve, protect and improve the air resources of the state to promote the public health and welfare.

DEFINITIONS:

1. Air pollution
2. Air contaminant
3. Director
4. Person
5. Board
6. Open fire

ADMINISTERING AUTHORITY:

Department of Health
Division of Air Pollution Control

AUTHORIZATIONS:

To generally enforce the act;
To develop a comprehensive air pollution control plan;
To issue regulations pursuant to the act;
To conduct air pollution studies;
To enter and inspect property in enforcement of the act;
To approve air pollution control installations;
To approve construction of potential air pollution sources;
To issue air pollution abatement orders.

PROHIBITED ACTS:

To fail to obtain permit for device installation or source construction;
To cause or allow air pollution in violation of regulations;
To violate other act provisions;
To fail to keep required records.

PENALTIES:

Fines of up to $500 or 30 days imprisonment.

RHODE ISLAND PESTICIDES

TITLE:

Pesticide Control Law
Rhode Island Laws 23-41.1

PURPOSE:

To control the dangers of pesticides through the regulation of pesticide sales, application, and use.

DEFINITIONS:

1. Commercial application
2. Commercial applicator
3. Control
4. Department
5. Director
6. Equipment
7. Economic threshold
8. Nontarget organism
9. Person
10. Pesticide
11. Target organism

ADMINISTERING AUTHORITY:

Department of Agriculture
Technical Pesticide Advisory Board

AUTHORIZATIONS:

To issue regulations pursuant to the act;
To classify pesticides and restrict pesticide usage;
To enter and inspect property in enforcement of the act;
To regulate the storage, transportation and disposal of pesticides;
To require proper pesticide labeling;
To establish certification standards and certify commercial applicators.

CERTIFICATION OR LICENSING:

License required for the application, use, sale, transport, or storage of restricted pesticides;
Categories of commercial applicator, noncommercial applicator, special licensee are established.

PROHIBITED ACTS:

To use, apply, sell, or transport any restricted use pesticide without a license;
To violate the terms of a license;
To violate other act provisions.

PENALTIES:

Fines of up to $500 or six months imprisonment.

RHODE ISLAND RADIATION

TITLE:

Radiation Control Act
Rhode Island Laws 23-1.3-1

PURPOSE:

To provide for a program of control of radiation sources and unnecessary radiation exposure.

DEFINITIONS:

1. Artificially produced radioactive material
2. Byproduct material
3. Department
4. Electronic product
5. General license
6. Naturally occurring radioactive material
7. Person
8. Radiation
9. Radiation source
10. Radioactive material
11. Registration
12. Special nuclear material
13. Specific license
14. Source material
15. Unnecessary radiation

ADMINISTERING AUTHORITY:

Department of Health
Radiation Advisory Commission

AUTHORIZATIONS:

To develop radiation hazard evaluations;
To issue regulations pursuant to the act;
To register and license radiation sources and persons;
To conduct studies and investigations relating to radiation hazards;
To enter and inspect property in enforcement of the act;
To declare radiation emergencies;
To act as the state lead agency in radiation matters.

PROHIBITED ACTS:

To manufacture, use or possess radiation sources not properly licensed or registered;
To install radiation sources without license;
To violate other act provisions.

PENALTIES:

Violation constitutes a misdemeanor

NRC AGREEMENT STATE: No

RHODE ISLAND SOLID WASTE

TITLE:

Solid Waste Law
Rhode Island Laws 23-46-1

PURPOSE:

To provide for the general control of solid waste disposal and to delegate refuse disposal responsibilities.

DEFINITIONS:

1. Solid waste
2. Segregated solid waste
3. Solid waste management facility
4. Person
5. Director

ADMINISTERING AUTHORITY:

Department of Health
Division of Solid Waste Management

AUTHORIZATIONS:

To require cities and towns to provide refuse disposal facilities;
To issue regulations relating to solid waste management;
To provide technical assistance to cities and towns;
To handle specialized solid waste problems;
To issue solid waste facility licenses;
To enforce the act.

PROHIBITED ACTS:

To construct or operate a solid waste facility without license;
To violate other act provisions or regulations.

PENALTIES:

Fines of up to $500 or 30 days imprisonment.

RHODE ISLAND WASTE WATER

TITLE:

Water Pollution Control Law
Rhode Island Laws 46-12-1

PURPOSE:

To generally provide for the control and abatement of water pollution to improve the public health and welfare of the state.

DEFINITIONS:

1. Sewage
2. Waters
3. Person
4. Pollution
5. Polluting
6. Director

ADMINISTERING AUTHORITY:

Department of Health
Division of Water Supply and Pollution Control

AUTHORIZATIONS:

To develop a comprehensive state water pollution plan;
To act as the state lead agency in water pollution matters;
To adopt water quality standards and classify state waters;
To approve proposed disposal system construction;
To administer the state pollutant discharge permit program;
To issue pollution abatement orders;
To enforce the act.

PROHIBITED ACTS:

To cause or allow pollution of waters of the state;
To construct or alter disposal systems without a permit;
To violate the terms of any permit;
To violate any orders or regulations under the act.

PENALTIES:

Fines of up to $500 or 30 days imprisonment.